APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
CHOU, ALBERT T

ART UNIT	PAPER NUMBER
2416	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/584,131	LARSSON ET AL.
	Examiner	Art Unit	
	ALBERT T. CHOU	2416	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>08 May 2009 for the amendment</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>20-39</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>20-24,31-36,38 and 39</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>23 June 2006</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
           application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>06/11/2009</u>.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   Applicants' amendments/remarks filed on May 8, 2009 have been entered.

Claims 20-38 have been amended and claim 39 has been added. Claims 20-39 are

pending in this application, with claims 20, 32, 33 and 38 being independent.

Drawings

2.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5)

because they do not include the following reference sign(s) mentioned in the

Specification:

      (a). Page 21, lines 5-6, of Applicants' Specification refer to steps S2-S10 and S2

in Fig. 7. However, there are no steps S2-S10 shown in Fig. 7.

      (b). Page 21, lines 22-23 and page 22, lines 1-7, of Applicants' Specification refer

to a node 10, a radio transceiver 20, route determination means 30, a cost optimization

31, a cost determination 21 and means 33 and a packet forwarding 40. However, there

is no any numeral designator found in Fig. 8.

      Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in

reply to the Office action to avoid abandonment of the application. Any amended

replacement drawing sheet should include all of the figures appearing on the immediate

prior version of the sheet, even if only one figure is being amended. Each drawing sheet

submitted after the filing date of an application must be labeled in the top margin as

either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the

changes are not accepted by the examiner, the applicant will be notified and informed of

any required corrective action in the next Office action. The objection to the drawings

will not be held in abeyance.

Claim Rejections - 35 USC § 101

3.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
> matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
> conditions and requirements of this title.

Claim(s) 32-39 are rejected under 35 U.S.C. 101 as not falling within one of the

four statutory categories of invention. While the claims recite a series of steps or acts to

be performed, a statutory "process" under 35 U.S.C. 101 must (1) be tied to particular

machine, or (2) transform underlying subject matter (such as an article or material) to a

different state or thing. See page 10 of In Re Bilski 88 USPQ2d 1385. The instant

claims are neither positively tied to a particular machine that accomplishes the claimed

method steps nor transform underlying subject matter, and therefore do not qualify as a

statutory process.

Regarding claim 32, *a method for cost optimization ..... comprising....* is broad

enough that the claim could be completely performed mentally, verbally or without a

machine nor is any transformation apparent.

Regarding claim 33, *a system for cost determination ….comprising means for determining a plurality of … ; and means for determining an optical cost …* (indeed is a <u>software system</u> implemented by software codes or algorithm) is broad enough that the claim could be completely performed mentally, verbally or without a machine nor is any transformation apparent.

Claims 34-37 depend from claim 33 and thus are rejected on the same ground of rejection as to claim 33.

Regarding claim 38, *a node enabling cost determination…comprising: means for determining ….; and means for determining an optical cost …*The node indeed a *software* node in light of its function, since it comprises a plurality of software means (there is no hardware structures associated with the node) which is broad enough that the claim could be completely performed mentally, verbally or without a machine nor is any transformation apparent.

Claim 39 depends from claim 38 and thus is rejected on the same ground of rejection as to claim 38.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by
> another filed in the United States before the invention by the applicant for patent or (2) a patent
> granted on an application for patent by another filed in the United States before the invention by the
> applicant for patent, except that an international application filed under the treaty defined in section
> 351(a) shall have the effects for purposes of this subsection of an application filed in the United States
> only if the international application designated the United States and was published under Article 21(2)
> of such treaty in the English language.

Claims 20-24, 31-36 and 38-39 are rejected under 35 U.S.C. 102(e) as being

anticipated by Biswas et al., "*Opportunistic Routing in Multi-Hop Wireless Networks*",

Second Workshop on Hot Topics in Networks, 'Online! 20 November 2003, pp. 1-6,

XP002319888 ("Biswas").

Regarding claims 20 and 33, Biswas teaches a method and a system for cost

determination independent of data packet forwarding in a multihop communications

network **[Title, Abstract & Fig. 1]**, comprising the steps of:

a computer-controlled node in the multi-hop communications network **[Fig.1;**

multi-hop wireless network comprising nodes A-D; Sec. 2] determining a plurality of

simultaneously potential next hop nodes for at least one of multiple nodes **[Fig. 1;**

simultaneously potential next hop nodes D, C & B; Sec. 2 & 3.1] from a source

node to a destination node in the network **[Fig. 1; e.g. a source node A and a**

destination node C; Sec. 2 & 3.1], such that said simultaneously potential nodes

jointly optimize a predetermined cost function **[Fig. 1; Choose a candidate subset of**

all its neighboring nodes. e.g. Nodes "D, C, B" in Fig. 1 if originating at "A"

destined for "C", with based on the shortest path/cost (prioritized by delivery

rates); Sec. 3 & 3.1], said plurality of simultaneously potential next hop nodes form a

subset of the neighboring nodes to said at least one of multiple nodes **[Fig. 1; Nodes**

"D, C, B" in Fig. 1, form a subset of the neighboring nodes of node A; Sec. 2, 3 &

3.1]; and

the computer-controlled node determining the optimal cost for said at least one of

multiple nodes to be equal to the optimized value of the predetermined cost function

[Fig. 1; choose the shortest number of hops/path and/or deliver ratios; Sec. 2, 3 &

3.1], wherein said optimal cost is dependent of a respective cost for each of said

plurality of simultaneously potential next hop nodes **[Fig. 1; the optimal cost is**

dependent of neighboring nodes, e.g. "D, C, B" in Fig. 1, based on the shortest

number of hops/path and/or delivery ratios; Sec. 2, 3 & 3.1].

Regarding claims 21, 34 and 39, Biswas teaches optimizing said predetermined

cost function based at least partly on an individual cost for each possible next hop node

for said at least one multiple nodes **[Fig. 1; optimizing the cost based the shortest**

number of hops or path and/or delivery ratio of each of "D, C, B" in Fig. 1; Sec. 2,

3 & 3.1].

Regarding claim 22, Biswas teaches optimizing said predetermined cost function

based at least partly on a cost factor due to said at least one of multiple nodes **"Fig. 1;**

optimizing the cost based the shortest number of hops or path and/or delivery
ratio (a factor) of each of "D, C, B" in Fig. 1; Sec. 2, 3 & 3.1].

Regarding claims 23 and 35, Biswas teaches determining a plurality of
simultaneously potential next hop nodes and an associated optimal cost node by node,
until a mesh of simultaneously potential routes is provided from the source node to the
destination node [Fig. 1; The process, i.e. determining a plurality of simultaneously
potential next hop nodes and an associated optimal cost node by node, is
repeated until the ultimate destination receives the packet; Sec. 3 & 3.1-3.3].

Regarding claims 24 and 36, Biswas teaches determining link parameters that
together with the plurality of simultaneously potential next hop nodes jointly optimizes a
predetermined cost function [Fig. 1; choose the shortest number of hops or path
along with information from delivery ratios (which are related to the signal quality
of links, transmission power, etc.); Sec. 2, 3 & 3.1].

Regarding claim 31, Biswas teaches associating the cost for a node with at least
one of delay, interference, number of hops and path loss [Fig. 1; choose the shortest
number of hops or path; Sec. 2, 3 & 3.1].

Regarding claim 32, Biswas teaches a method for cost optimization independent
of data packet forwarding in a routing protocol in a communications network [Title,

Abstract, Fig. 1 & Sec. 1], further comprising optimizing a predetermined cost function

[Fig. 1; selecting the candidate forwarder set; Sec. 3 & 3.1] , whereby an optimal

cost and a plurality of simultaneously potential next hop nodes are determined for at

least one of multiple nodes from a source node to a destination node **[Fig. 1; Choose a**

candidate subset of all its neighboring nodes. e.g. Nodes "D, C, B" in Fig. 1 if

originating at "A" destined for "C", with based on the shortest path/cost

(prioritized by delivery rates); Sec. 3 & 3.1], wherein said optimal cost is dependent

of a respective cost for each of said plurality of simultaneously potential next hop nodes

[Fig. 1; the optimal cost is dependent of neighboring nodes, e.g. "D, C, B" in Fig.

1, based on the shortest number of hops/path and/or delivery ratios; Sec. 2, 3 &

3.1], and said plurality of simultaneously potential next hop nodes form a subset of the

neighboring nodes to said at least one of multiple nodes **[Fig. 1; Nodes "D, C, B" in**

Fig. 1, form a subset of the neighboring nodes; Sec. 2, 3 & 3.1].

        Regarding claim 38, Biswas teaches a node enabling cost determination

independent of data packet forwarding in a multihop communications network **[Title,**

Abstract & Fig. 1], comprising:

        means for determining a plurality of simultaneously potential next hop nodes for

said node **[Fig. 1; e.g. determining simultaneously potential next hop nodes D, C &**

B for a source node A; Sec. 2 & 3.1], such that said simultaneously potential next hop

nodes jointly optimize a predetermined cost function **[Fig. 1; Choose a candidate**

subset of all its neighboring nodes. e.g. Nodes "D, C, B" in Fig. 1 if originating at

"A" destined for "C", with based on the shortest path/cost (prioritized by delivery rates); Sec. 3 & 3.1], said plurality of simultaneously potential next hop nodes form a subset of the neighboring nodes to said at least one of multiple nodes [Fig. 1; Nodes "D, C, B" in Fig. 1, form a subset of the neighboring nodes to node A; Sec. 2, 3 & 3.1]; and

means for determining an optimal cost for the node to be equal to the optimized value of the predetermined cost function [Fig. 1; choose the shortest number of hops/path and/or deliver ratios; Sec. 2, 3 & 3.1], wherein said optimal cost is dependent of a respective cost for each of said plurality of simultaneously potential next hop nodes [Fig. 1; the optimal cost is dependent of neighboring nodes, e.g. "D, C, B" in Fig. 1, based on the shortest number of hops/path and/or delivery ratios; Sec. 2, 3 & 3.1].

Allowable Subject Matter

5.   Claims 25-30 and 37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Remarks

6.   In light of Applicants' amendments, the 35 USC 101 rejections to claims 20-31 have been withdrawn.

7.   Applicants' remarks/amendments filed May 8, 2009 regarding the rejection of

claim 38 have been fully considered but they are not moot in view of new ground of

rejection.

8.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Albert T. Chou whose telephone number is 571-272-

6045. The examiner can normally be reached on 8:30 - 17:00.

        If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Chi H. Pham, can be reached on 571-272-3179. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

        Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

/Albert T Chou/
Examiner, Art Unit 2416
July 6. 2009